SUMMARY
BIOLOGICAL OPINION ON THE EFFECTS TO
THE MEXICAN SPOTTED OWL AND APACHE TROUT
FROM THE PROPOSED
FOREST SERVICE, REGION 3 MANAGEMENT ACTIVITIES

Date of the opinion: December 3, 1993

2-21-93-F-457
2-21-93-F-458
2-21-93-F-459
2-22-93-F-378
2-22-93-F-416
2-22-93-F-464
2-22-93-F-506

Action agency: U.S. Forest Service, Region 3.

Project: Twenty-two proposed and on-going management activities on nine forests in New Mexico and Arizona. No projects for the Apache-Sitgreaves, or Kaibab Fe National Forests were submitted. Activities include timber harvest, fuel management (prescribed burns), powerline construction, land exchange, allotment management plans, and campground construction.

Listed species affected: Mexican spotted owl (Strix occidentalis lucida) and Arizona hedgehog cactus (Echinocereus triglochidiatus var. arizonicus).

Biological opinion: Non-jeopardy

Incidental take statement: Level of take anticipated, 7 Mexican spotted owls due to harm caused by habitat destruction and disturbance during the breeding season. No direct mortalities are authorized for the Mexican spotted owls.

Reasonable and prudent measures: Three objectives for minimizing incidental take are provided for the Mexican spotted owl. Implementation of these measures through terms and conditions is mandatory (pages 20-22).

Terms and conditions: Limits set by Forest Service Region 3 Interim Directive 2 will be met, disturbance to breeding pairs will be avoided during the breeding season, additional restrictions are placed on harvesting owl habitat in management territories, and extensive monitoring is required (pages 20-22).

Conservation Recommendations: Implementation of conservation recommendations is discretionary. Fourteen conservation recommendations are provided (pages 23-25).

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Ecological Services
Suite D, 3530 Pan American Highway, NE
Albuquerque, New Mexico 87107

December 14, 1993

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Larry Henson, Regional Forester
U.S. Forest Service
Southwestern Region
517 Gold Avenue SW
Albuquerque, New Mexico 87102-0084

Dear Mr. Henson:

This is in response to your letters of 9 July, 23 July, 29 July, 19 August, and 3 September 1993, requesting formal consultation with the Fish and Wildlife Service (Service) under section 7 of the Endangered Species Act for an original total of 22 projects in the Southwestern Region of the Forest Service. The formal consultation period began on 12 July 1993, the day we received your request. Your letter of 26 August 1993, indicated you wished to have your "post-May" requests for formal consultation included in a single resultant biological opinion. The species of concern for this consultation is the Mexican spotted owl (Strix occidentalis lucida) which is listed as threatened under the Endangered Species Act. The best scientific data available, including data in our files, consultation with experts, site visits, interagency meetings, and literature review were used in this biological opinion. With the exception of the Arizona hedgehog cactus (Echinocereus triglochidiatus) in the Lyons Fork Allotment Management Plan (AMP), and peregrine falcon (Falco peregrinus) and bald eagle (Haliaeetus leucocephalus) on the Ole Powerline project, the Service concurs with your finding of "no effect" to other listed species which were included in the biological information provided with your request for consultation.

Based on the information provided in the May 27, 1993, Biological Assessment (BA), the Service cannot concur with your finding that the proposed Lyons Fork AMP does not affect the endangered Arizona hedgehog cactus (Echinocereus triglochidiatus var. melanacanthus) in the Lyons Fork grazing allotment. Contrary to the conclusions in the BA, we believe Arizona hedgehog cactus occurs in the allotment. We recommend that the presence or absence of Arizona hedgehog cactus be re-assessed, and if the species is found on the allotment, an assessment of the effects of the action be completed. Our specific concerns and questions about the conclusions and information in the BA follow.

We believe the information presented in the BA does not substantiate the conclusion that Arizona hedgehog cactus does not occur on the Lyons Fork allotment. The absence of records in the District office and the Arizona Game and Fish Department Heritage Data Base of Arizona hedgehog cactus on the Lyons Fork allotment reflects the fact that very few surveys for the species have been done in this allotment or elsewhere. We recommend additional site visits and surveys in the allotment to determine the presence or absence of the cactus.

Newly available habitat information also indicates that the Arizona hedgehog cactus may occur on the Lyons Fork allotment. The species has been found growing on Schultze Granite, Apache Leap Dacite, Pinal Schist and the Pioneer Formation. According to Steve Viert, a consultant with Cedar Creek Associates who is collecting biological information on Arizona hedgehog cactus for the Carlota Copper Project, Apache Leap Dacite may occur in the Lyons Fork allotment. He believes that Arizona hedgehog cactus may occur on this substrate in the allotment.

The Service has questions about the identity of some hedgehog cactus found on the western side of the allotment that were identified by Dr. Frank Crosswhite in 1992. He determined that the plants were Echinocereus triglochidiatus var. melanacanthus, not a listed variety of hedgehog cactus. At the time Dr. Crosswhite identified these plants, he may not have been aware of a proposed taxonomic revision of the genus, or the revision may not yet have been proposed. Regardless, Drs. Bruce Parfitt and Allan Zimmerman, taxonomic experts on the species, as well as Steve Viert and the Service now believe that the definition of E. t. var. arizonicus has been expanded. Under this circumscription of the species, the specimens on dacite and granite and nearby exposed bedrock in chaparral communities in the Globe area that have previously been assigned to E. t. var. melanacanthus now appear to fit within the definition of E. t. var. arizonicus. In his treatment of the genus for the Flora of North America, Dr. Parfitt may raise Arizona hedgehog cactus to full species status as Echinocereus arizonicus. Based on this information, we believe that the specimens identified as E. t. var. melanacanthus in the Lyons Fork allotment are E. t. var. arizonicus.

If further site visits indicate the presence of the Arizona hedgehog cactus, the Service recommends that the Forest Service evaluate the effects of the proposed AMP on the species. The Service would need additional information about the proposed action to prepare a biological opinion or to determine whether or not we concur with the Forest Service's finding of no affect. Until the Forest Service evaluates the effects of livestock grazing as proposed under the AMP, we recommend that no livestock be turned out into pastures containing or that may contain the plant.

On November 29, 1993, Arizona Ecological Services State Office staff discussed our concerns regarding the Arizona hedgehog cactus and the Lyons Fork AMP with Mike Ross, Don Pollock, and Anthony Miller of the Tonto National Forest. We will continue to work with the Forest regarding our mutual concerns. Service biologists are working with Tonto National Forest biologists to resolve that issue.

Larry Henson, Regional Forester

DESCRIPTION OF THE PROPOSED ACTION

The Forest Service proposes an action consisting of 22 projects on National Forests in Region 3 (Arizona and New Mexico) of the Forest Service. The proposal consists of planned and on-going activities which the Forest Service has determined may affect the Mexican spotted owl (owl), a threatened species under the Endangered Species Act of 1973, as amended. The activities include projects on 9 of the 11 National Forests in Region 3; no projects on the Apache-Sitgreaves or Kaibab were included.

The projects in this consultation package include timber sales, gas well development, powerline construction, aspen regeneration, recreation projects, fuel management (prescribed burns), land exchange, allotment management plans, and campground construction. These activities are summarized in Table 1

Table 1. Summary of project numbers and types. See Table 2 for a list of projects.

State	National Forest	Timber Sales	Recreation	Other[1]	Total
Arizona	Coconino	2	0	0	2
	Coronado	0	1	0	1
	Prescott	0	0	1	1
	Tonto	0	0	2	2
Subtotal		2	1	3	6
New Mexico	Carson	1	0	3	4
	Cibola	1	0	0	1
	Gila	2	0	3	5
	Lincoln	1	1	1	3
	Santa Fe	2	0	1	3
Subtotal		7	1	8	16
Region Total		**9**	**2**	**11**	22

[1] includes fuel treatments (prescribed burns), allotment management plan, structural range improvements, land exchange, campground construction, pipeline, compressor platforms, roads, mines, and others.

(Table 5 from L. Henson, Regional Forester, in litt. 1993).

Three of 6 Arizona projects and all 14 New Mexico projects submitted in this consultation package included a determination of "may affect, not likely to adversely affect" (Table 2). Section 7 consultation regulations permit projects, which the Service concurs may affect but will not likely adversely affect, to be released after informal consultation if the Service concurs in writing with the action agency's finding. The Service concurred with 11 projects as not likely to adversely affect (Table 2).

The projects will affect 6,029 acres of suitable owl habitat and 2,249 acres of capable owl habitat. Suitable habitat is habitat that meets all of the needs of the owls including nesting, roosting, and foraging. Capable habitat is habitat that has been suitable in the past, but because of natural or human caused changes, no longer meets all of the needs of the owl. Capable habitat may still be used for foraging but generally lacks the characteristics needed for reproduction. Table 3 lists the acreage by forest.

Table 2. Twenty-two projects that comprise the action submitted for formal consultation. The date of Service concurrence with a determination of "may affect, not likely to adversely affect" is indicated, as well as the Forest Service's agreement to implement project modificatiens necessary for concurrence

Forest and Project Name	Date of Concurrence
Coconino NF	
Crackerbox Timber Sale	
Maverick Timber Sale	
Coronado NF	
Twilight Campground Construction	
Prescott NF	
Erickson Land Exchange	
Tonto NF	
Lyons Fork Allotment Management Plan	
Pinal Mountain Prescribed Burns	
Carson NF	
Chicken Fry Canyon Wells	September 8, 1993
Caracas Area Wells	September 8, 1993
Mestenas Area Wells	September 8, 1993
La Manga Timber Sale	
Cibola NF	
Sawyer Timber Sale	
Gila National Forest	
Signal Peak Road Improvement	November 23, 1993
Black Mountain Burn	July 23, 1993
Badger Aspen Regeneration	July 23, 1993
Jones KV Thinning	July 23, 1993
Cold Water Thinning	November 18, 1993
Lincoln National Forest	
Mexican Canyon Trestle	September 8, 1993
Camp Wehinahpay Land Exchange	September 8, 1993
Hornbuckle Mistletoe Suppression	
Santa Fe National Forest	
South Ojitos Timber Sale	November 18, 1993
Ole Powerline	
Road 18 Timber Sale	

Table 3. Summary of suitable and capable habitat acres affected by proposed projects.

State	Forest	Suitable	Capable	Total
Arizona	Coconino	23	1228	1251
	Coronado	0	8	8
	Prescott	24	16	40
	Tonto	4395	0	4395
Subtotal		4442	1252	5694
New Mexico	Carson	948	17	965
	Cibola	5	0	5
	Gila	250	625	875
	Lincoln	57	4	61
	Santa Fe	327	351	678
Subtotal		1587	997	2584
Region Total		**6029**	**2249**	**8278**

PROJECT DESCRIPTIONS:

Crackerbox Timber Sale

Acording to the biological evaluation (BE), the Crackerbox Timber Sale consists of 48 harvest units totaling 2,131 acres on the Blue Ridge District of the Coconino National Forest. Portions of six owl management territories (MTs) overlap the sale area boundary. The southern one-third of the area is dominated by multi-storied mixed conifer, and the northern portion is dominated by ponderosa pine, cover types. The Forest Service determined that 4,439 acres (61% of the sale area) was unsuitable owl habitat. The remainder was classified as capable or suitable owl habitat.

The Forest Service identified two primary stand objectives for the sale; these were the increase of tree vigor and growth by stocking level control, and the decrease of infection and spread of dwarf mistletoe. Three treatments were proposed. Intermediate harvests, characterized as low thinnings, would occur on 1,947 acres. Sanitation treatments would occur on 66 acres. The remaining 118 acres would be seed cuts.

The Forest Service estimated that 23 acres, outside of MTs, of suitable owl habitat would be converted to capable. No treatments are scheduled for core areas of the MTs. Fourteen stands, totaling 564 acres, of what the Forest Service determined to be unsuitable habitat (but also termed as potential foraging habitat) are proposed for harvest within four MTs. One of the MTs contains 899 acres of suitable owl habitat and would undergo intermediate harvest on 73 acres of unsuitable habitat. Another MT (containing 728 acres of suitable habitat) would receive intermediate harvest and seed cut treatments on 157 and 20 acres, respectively, of unsuitable habitat. A third MT (containing 375 acres of suitable habitat) would have 302 acres of unsuitable habitat treated with an intermediate

harvest, and another 13 acres treated with seed cuts. The fourth MT (containing 427 acres of suitable habitat) would have 112 acres of unsuitable habitat treated with intermediate harvests and 5 acres treated with a seed cut. The Fuller Timber Sale previously harvested an additional 295 acres within this fourth MT. Of the remaining treatments, 575 acres are in capable owl habitat. The remaining 960 acres of treatment are in unsuitable owl habitat.

Slash treatments include pile and burn, lop and scatter, lop and underburn, and no treatment. No new roads will be constructed or relocated. The Forest Service indicates the majority of the sale area has a canopy closure between 40 and 60%. The area was expected to meet the Dispersal Habitat Rule (DHR) after treatment. The Forest Service determined that this project may affect, and is likely to adversely affect, the owl.

Erickson Land Exchange

The Erickson land exchange involves the exchange of a single parcel of approximately 37.65 acres of land on the Prescott National Forest for a parcel of private land on the Apache-Sitgreaves National Forests. The parcel to be exchanged away is within an owl MT which is 2,668 acres in size and which contains at least 2,602 acres of suitable owl habitat. The MT contains an additional 218 acres of suitable owl habitat on private land. The parcel is not within the 390 acre core area identified within the MT. In 1991, a pair of owls was located approximately 1.75 miles south of the exchange parcel. In 1992, informal monitoring efforts located the pair approximately 1.75 miles southwest of the parcel. The Forest Service estimated that the parcel contains 24 acres of suitable, and 16 acres of capable owl habitat. The Forest Service indicated that the MT is adjacent to several large blocks of private land, but that it was not possible to determine the present or future status of habitat availability on those lands. The Forest Service determined that the proposed land exchange may affect, and is not likely to adversely affect the Mexican spotted owl.

Lyons Fork Allotment Management Plan

According to the BE, the Lyons Fork Allotment encompasses 31,160 acres and is located on the Globe Ranger District of the Tonto National Forest. The allotment includes 24,000 acres of Forest Service lands, 7,000 acres of State land, and 160 acres of Bureau of Land Management land. The portion on Forest Service land includes boulder strewn slopes on the western edge vegetated with scattered brush and perennial grasses, open semi-desert grasslands through the middle section and the eastern portion, and large areas of ponderosa pine and mixed conifer on the Pinal Mountains. The Forest Service indicates the pine type contains accumulations of heavy slash. The Forest Service desires to institute an aggressive prescribed burning program in the Pinal Mountains in an attempt to preclude future catastrophic wildfires.

The proposed action is to implement a rest deferred rotation grazing management system. Implementing the system will require the construction of five structural projects and one non-structural project. These projects

include reconstruction of the Mine/Middle Pasture division fence, Mine Pasture Spring development, Bobtail Spring developments, and reconstruction of Black Rock Corral. These structural improvements are all outside of owl suitable habitat and MTs. Development of Wild Cow Springs appears to be at the boundary of an owl MT. According to the BE, water will be piped from this spring to a trough approximately 1,320 feet downstream and away from owl habitat. Livestock grazing will occur and perhaps increase in two MTs. One objective of the AMP is to reduce the historic grazing pressure in the Black Rock pasture of the allotment. An increase in use in the chaparral vegetation types of the eastern and western portions of the allotment will occur. In one MT, the allotment is restricted to what is described as unsuitable owl habitat. The allotment is in chaparral vegetation in this MT. The allotment includes most of the other MT. According to the proposed grazing schedule, livestock will be in this pasture 2 out of 5 years during the owl breeding season. The Forest Service asserts that preferred owl habitat usually occurs in areas where topography and forage conditions combine to make them generally undesirable for livestock use. For instance, in this project potential livestock forage in the ponderosa pine understory is extremely limited and the severity of the slope greatly restricts livestock use. Also included is the 2,560 acre Bobtail Pasture prescribed burn. The primary goals of the prescribed burn are to reduce the existing high fuel loading in both the brush and conifer types and to open up the dense stands of manzanita to allow establishment of ponderosa pine. Some hand line construction is proposed, but existing natural boundaries and trails will also be used as fire breaks. The burns are planned to be ignited at the summits of the ridgetops with subsequent slow creeping of fire downslope. The proposed time of the burns would be after October 1.

Portions of two owl MTs have been identified within the ponderosa pine type of the proposed burns. One of the MTs (containing 1,102 acres of suitable owl habitat) has 95% of its suitable habitat and the entire core area within the allotment. The majority, including the core and all of the suitable owl habitat, of the other MT is outside of the allotment. Two burn blocks are proposed for the Bobtail prescribed burn. Inspection of a map supplied with the BE indicates that one of the blocks contains less than half of the suitable owl habitat and less than half of the core area of the MT. The other block contains more than half of both the suitable habitat and the core area. As proposed, and in conjunction with the Pinal Mountains prescribed burn, no more than one owl core area would be burned in a given year. Nest tree groves would be pre-treated or lined to protect them from prescribed fire. The Forest Service determined that this project may affect, and is likely to adversely affect, the owl.

This project and the Pinal Mountains prescribed burn project were discussed in a meeting with Tonto National Forest personnel on November 22, 1993. At that meeting, the Forest Service indicated that the burning projects could be modified. The size of the burning blocks and the schedule of burning as impacts to individual owls was of concern to the Service. The Forest Service agreed that the burning plans would be modified to incorporate the following conditions.

Prescribed burns will only be conducted outside of the owl breeding season. The structural components of known or suspected owl nest sites will be fully protected and retained in any prescribed burn. In addition, the Forest Service will evaluate each individual site and protect the nest site in the most appropriate manner. Up to 25% of a given MT may be treated in any 1 year, including no more than 25% of the core area. Burning units will be small (approximately 250 acres) when a MT is involved. One full year will elapse between successive burns in any MT. In other words, a MT may be burned in year 1, will not be burned in year 2, and may be burned in year 3. The estimated average residual fuel load in the project area is expected to be approximately 15 tons per acre. The formal and informal monitoring that has been done in the past for the MTs in this project will continue after the treatment.

Burning in these two projects is not expected until the fall of 1994. Prior to that time, the burning plans will be modified to incorporate the above changes. The modified burning plans will then be provided to the Service for review.

Maverick Timber Sale

The Maverick Timber Sale consists of 6 harvest units totaling 653 acres on the Blue Ridge District of the Coconino National Forest. Portions of two MTs overlap the sale area boundary. Multistoried, mixed conifer cover types are found on north-facing slopes and drainages. Ponderosa pine/Gambel oak cover types dominate the broad level uplands and ridges. The Forest Service determined that this was either suitable or capable habitat.

The Forest Service identified two primary stand objectives for the sale; these were the increase of tree vigor and growth by stocking level control, and the decrease of infection and spread of dwarf mistletoe. Three treatments were proposed. Low thinning would occur on 318 acres. Sanitation treatments would occur on 311 acres. The remaining 24 acres would receive a liberation treatment.

The Forest Service indicated that no stands in suitable owl habitat would be treated. Ten stands, totaling 653 acres, of capable habitat were scheduled for treatment. However, recommendations made in the biological evaluation included two changes to the timber sale. The first was that a 132-acre stand scheduled for intermediate harvest in one of the MTs would be dropped from the sale. This would result in no treatments in the two MTs from this sale. The second change was to alter the treatment in the stand that was to receive a liberation cut to a sanitation cut. The Forest Service indicated these recommendations were now modifications to the sale and would be implemented (Calish, in litt.).

Slash treatments include pile and burn, lop and scatter, and underburn. No new roads will be constructed. The Forest Service indicates the majority of the sale area has a canopy closure between 40 and 60%. The area was expected to meet the 50-9-40 rule after treatment. The Forest Service

determined that this project may affect, but is not likely to adversely affect the owl.

Pinal Mountains Prescribed Burns

The analysis area for the Pinal Mountains prescribed burns contains approximately 10,240 acres and is located on the Globe Ranger District of the Tonto National Forest. The vegetation present includes ponderosa pine, mixed conifer, pinyon/juniper, and chaparral cover types. The Forest Service indicates the pine type consists of dense stands; the understory is a mixture of dead and down material and scattered brush averaging 30 tons per acre of fuel loading. The Forest Service desires to institute an aggressive prescribed burning program in the Pinal Mountains in an attempt to preclude future catastrophic wildfires.

The project consists of three separate burn areas. The Pinal Mountain burn consists of approximately 8,000 gross acres (3,730 acres are expected to be treated) divided into 10 burn blocks. The Madera Ridge burn consists of two blocks 450 acres in size (338 acres are scheduled for treatment). The Pioneer Pass burn consists of two blocks containing 250 acres (approximately 125 acres will be treated). The burns would be completed by block until all 14 blocks were treated. One or two of the blocks would be burned each fall with the overall goal of treating the entire area within 8 years. The primary goals are to reduce the existing high fuel loading in both the brush and conifer types and to open up the dense stands of manzanita to allow establishment of ponderosa pine. Some hand line construction is proposed, but existing natural boundaries and trails will also be used as fire breaks. The burns are planned to be ignited at the summits of the ridgetops with subsequent slow creeping of fire downslope. The proposed time of the burns would be after October 1.

The biological assessment/evaluation (BE) for this project indicates that portions of four owl MTs have been identified within the ponderosa pine type of the proposed burns. A map supplied with the BE indicated that a total of six MTs were overlapped by the burn blocks, although the overlap for two of the MTs was small. All the suitable owl habitat in the Pinal Mountains is associated with these six MTs. Two of the MTs (one contains 1,105, and the other 710, acres of suitable owl habitat) have all of their suitable habitat and core area within the project area. A third MT (1,256 acres of suitable habitat) has 73% of its suitable habitat and 78% of its core overlapped by the burn blocks. A fourth MT (1,102 acres of suitable habitat) has 5% of its suitable habitat within the burn blocks. However the bulk of the core area and the suitable habitat will be treated with a prescribed burn in the Lyons Fork allotment management plan. The fifth MT (810 acres of suitable habitat) has 57% of its suitable habitat and 90% of the core area within the burn blocks. The remaining MT (598 acres of suitable habitat) overlaps the project boundary with 5% of the core and 3% of the suitable habitat. The size of the burn blocks ranges from 50 to 2,650 acres. The amount of suitable habitat treated in a given proposed burn block within an MT ranges from 0 to 672 acres. The percentage of the suitable habitat treated in a burn block within an MT ranges from 0 to 85%. The percentage of a MT in a burn block ranges from 0 to 50%. The amount of

core area acreage in a burn block ranges from 0 to 392 acres. The percentage of a core area treated in a burn block ranges from 0 to 87%. As proposed, no more than one owl core area would be burned in a given year. Nest tree groves would be pre-treated or lined to protect them from prescribed fire. The Forest Service determined that this project may affect, and is likely to adversely affect, the owl.

The Forest Service agreed to modify this project. See the project description for the Lyons Fork AMP.

Twilight Campground

The Twilight Campground is currently a dispersed camping area, covers an estimated 10 acres, and is used by an estimated 4 groups per weekend. A developed campground is proposed in the currently used area. The proposal includes improving and realigning existing roads; adding new roads; closing existing roads; improving existing and adding new vehicle pull-outs; paving the newly constructed roads; installing pipelines in the road beds for later hook-up to a water source; adding toilets, covered and uncovered ramadas, cooking grills, and picnic tables; improving the existing pull-outs along the dirt access road to accomodate recreation vehicles; and developing a spring or drilling a well to provide water to the area. The completed campground will cover approximately 9.5 acres and consist of three spur roads branching from a central loop. In addition, a parking area with space for six vehicles will be located at the end of the access road and another toilet building will be built. The end of each spur road will consist of a one-way loop. The area surrounded by the loop will contain a hexagon-shaped covered ramada 33 feet to a side, fire rings, and pedestal grills for large group activities. Thirty-two camp sites, each with a 30-foot spur road for vehicle parking , will be created. The camp sites are hexagon-shaped (12 feet to a side) with a square tent area attached. Each camp site will contain a picnic table and campfire grill or pedestal grill.

Within the campground area, the tree component consists of mature ponderosa pine with a few Douglas fir and a very sparse understory of oak. The original BE stated that the proposed project is within capable owl habitat in a core area of one owl MT (which contains 1,246 acres of suitable habitat), and outside the core area of another MT (which contains 2,046 acres of suitable habitat). The core area of concern was located within the developed area of Turkey Flat. Owls were located in the cabin area or along Swift Trail in 1985, 1987, and 1990. Despite several attempts, no known or inferred nest has been located for the MT. The Forest Service believes that the closest nesting area is at least 0.6 miles from the project site. However, the BE also stated that the potential consequence of noise disturbance may be to affect reproduction, and survival of young in one core area for a season. The construction will remove 40 to 50 trees greater than 6 inches in diameter at breast height (dbh). The canopy coverage of the 10 acres of development would be reduced from 50-60% to 40%. An increase in road traffic and camping recreation is expected, although the maximum Persons At One Time (currently 200) is not expected to increase.

The BE was subsequently modified. The core area of the MT was redefined to not include any of the Turkey Flat summer home area. However, the summer home area was originally included because of historic and recent sightings of owls next to cabins. The project site is no longer in the core area. The Forest Service no longer believes the project site contains capable (suitable) owl habitat. The Forest Service determined that the project may affect, but is not likely to adversely affect, the owl.

La Manga Timber Sale

The La Manga Timber Sale is located on the Carson National Forest within the El Rito Ranger District. The project area encompasses 5,082 acres of the Carson National Forest. The La Manga project area consists of a mosaic of habitats that include ponderosa pine (35%), mixed conifer (37%) spruce/fir (5%) and aspen (15%) stands as well as riparian, grassland and meadow areas (8%). According to the Draft Environmental Impact Statement (DEIS), 42% of the project area is old growth successional stage, 14% is mature forest, 17% is mid-aged forest, 23% is young forest, 0% is seedling/sapling, and 4% is grass/forb/shrub stages. Ponderosa pine structure varies from a high density of young pole size trees to closed canopy old growth. Mixed conifer (i.e., Douglas fir, white fir and ponderosa pine) stands consist of young pole size trees to mature growth with multi-storied canopies and patches of aspen interspersed. Aspen stands are mature to old growth with few replacement saplings regenerating. In addition, high elevation grass meadows and open areas are well scattered throughout the area; most are associated with intermittent streams and areas with ground water close to the surface. Some small canyons and rocky areas exist in the northeastern and western portion of the project area.

The proposed project would treat 1,164 acres and allocate 2,397 acres to old growth. Proposed harvest prescriptions combine commercial thinning, group selection, single tree selection, and shelterwood removal. Prescribed burning is also proposed to treat 424 acres of the project area. The Forest Service proposes to build 8.49 miles of new temporary and permanent roads and close 29 miles of road after completion of the project.

No owls were located during surveys conducted throughout the project area. The majority of the planning area is considered suitable (2,918 acres) or capable (778 acres) owl habitat. Suitable habitat consists of 802 acres within ponderosa pine habitat and 2,116 acres within mixed conifer habitat. The project proposes to treat 948 acres of suitable and capable owl habitat. According to the Biological Assessment, the La Manga Timber Sale project may affect the habitat of the owl.

Although no owls were located within the project area, harvesting within suitable owl habitat may have adverse affects to owls in northern New Mexico. Altering suitable habitat could negatively affect dispersing juveniles, migrating adults, or foraging habitat. However, the project displays interesting possibilities for improving forest health as well as decreasing the threat of catastrophic fire (see BA Table 3). Because minimum requirements for owls are unknown at this time, the Service cannot concur with the may effect, not likely to adversely effect. The Service

generally recommends that no harvest take place within suitable habitat to ensure the recovery of the owl. However, this sale proposes treatments in unoccupied, suitable habitat that will attempt to retain high canopy closure, multiple canopy layers and other attributes of suitable owl habitat. Although the DEIS discusses post-harvest monitoring, a detailed discussion of monitoring techniques should be provided to determine whether the goals of the project have been met and to determine how rapidly post-harvest conditions change. The Service believes that if the Forest is willing to determine pre-harvest stand conditions (canopy closure and tree size distribution), remeasure the same areas immediately following harvest, and monitor conditions annually for 5 years, the benefits of the information gained would offset any costs to the owl.

Sawyer Timber Sale.

The Sawyer Timber Sale is in the Mount Taylor Ranger District of the Cibola National Forest in the Zuni Mountains. The analysis area lies within sections 23-28, and 33-36, T12N, R14W. The analysis area includes 3,200 acres. The Forest Service proposes harvest on 428 acres in 10 cutting units that will yield 876,000 board feet. There will be 358 acres identified as commercial thin and 70 acres of dwarf mistletoe control sanitation salvage. The commercial thin is proposed to remove nearly all trees greater than 18 inches dbh. The mistletoe control proposed on 70 acres leaves a mix of tree sizes and thus retains multiple canopy layers.

The surveys conducted in 1991 and 1992 found no owls in the analysis area. There are two owl management territories adjacent to the analysis area. No activities proposed in the Sawyer Timber Sale are expected to be close enough to either of these territories to have a direct effect on them.

No direct effects of the action are expected because no owls are present. There will be potential indirect effects due to habitat alteration. Construction of a haul road through an area of suitable habitat is expected to impact 2 acres with the removal of approximately 12 trees. After the sale is completed this road will be closed with a locked gate. In addition, potential dispersal and foraging habitat will be subjected to light overstory removal. Larry Cosper (Cibola National Forest Biologist) informed the New Mexico Ecological Services State Office that following the sale, the area will still meet the requirements of the dispersal habitat rule.

Hornbuckle Canyon Mistletoe Suppression

The Hornbuckle dwarf mistletoe suppression project was scheduled for Fiscal Year 1993. The project area is located in Section 30, T18N, R12E, in the Cloudcroft District of the Lincoln National Forest. The proposed treatment area consists of approximately 35 acres and is part of a larger stand that has been monitored by Forest Pest Management since 1979. The stand consists mainly of pole and small sawtimber sized Douglas fir and ponderosa pine. The ponderosa pine is heavily infested with dwarf mistletoe.

The lower, western portion of the stand, which is primarily ponderosa pine, is where the treatment is proposed. An irregular group shelterwood treatment would reduce the basal area from 110-120 to approximately 50 square feet of basal area (ba) per acre. The least infected ponderosa pine would be left as a seed source, and Douglas fir would also be left. This will leave a complex canopy structure, and is expected to provide ponderosa pine regeneration. All existing snags will be left, and after regeneration occurs, enough ponderosa pine trees greater than 12 inches dbh will be killed to leave 5 snags per acre for wildlife. Following the mistletoe thinning, a prescribed burn will be used to reduce fuel loads and to prepare the site for regeneration.

The project area is located within the Bridge owl MT and lies adjacent to the core. The area was identified as capable habitat when the MT was established, and at this time it just meets the criteria for suitable. The Bridge territory was monitored from 1989-1992. During 1989 and 1990, the territory was occupied by a pair of owls. In 1991 and 1992, the territory was unoccupied. At this time the territory consists of 1,367 acres of suitable habitat, no capable or unsuitable, and 633 acres of private land.

The Forest determined that because the treatment will convert marginally suitable habitat to capable, it will be adverse. Because of the severe mistletoe infection in ponderosa pine, the habitat value is expected to decline over the next 20 years if the stand is not treated. Without treatment conifers are expected to be replaced with oak brush and the habitat would remain unsuitable for many years. The proposed treatment is expected to allow the stand to return to suitability and remain so after removing dwarf mistletoe and regenerating ponderosa pine. Activity will not be permitted during the owl breeding season unless it can be shown by monitoring that owls are not breeding on the territory during the period May 1 - June 30.

Ole Powerline

The proposed project is a large capacity electric line to be built across the north end of the Jemez Mountains. It begins at Abiquiu Reservoir and proceeds south, terminating east of the Rio Grande at the Norton Substation. Surveys were conducted using Region 3 Forest Service protocol in 1989, 1991, 1992, and 1993. There were no owl responses in the project area. However, the line does pass through one owl MT core. The powerline will convert 37.5 acres in the core from suitable to unsuitable, and maintain it as unsuitable for the life or the powerline. An additional 268.4 acres of suitable mixed conifer, and 195.7 acres of ponderosa pine habitat on Forest Service land will be similarly converted.

At this time it is not clear whether the MT is occupied. According to Forest Service Interim Directive Number 2, 5 years of formal monitoring, with no owl sightings, is required to determine that a MT is no longer in use. Given that formal monitoring has not occurred, the Service believes that the territory may still be in use.

If the territory is still in use, the nest and roost sites are unknown. Therefore habitat treatments and construction activities that occur within or within 1/4 mile of a core during the breeding season will likely result in take of owls. The biological assessment makes no mention of seasonal closure on construction activity.

The biological assessment provided by the Forest Service states that an Environmental Impact Statement for this project was prepared in 1986. It also notes that the Service was consulted concerning peregrine falcons and bald eagles. Because that consultation occurred so long ago, and because of changes in the population status of both of those species in New Mexico since 1986, the Service has concerns about the potential effects of the project on bald eagles and peregrine falcons. No information on either of these species was submitted with the Forest Service June 8, 1993, biological assessment of this project. The Service recommends that the Forest Service initiate section 7 consultation for those species prior to issuing a permit for the construction of the Ole Powerline.

Road 18 Project

The Road 18 project area encompasses 1,900 acres in the Pecos and Las Vegas Ranger Districts of the Santa Fe National Forest. The project area is located in the eastern third of the 16,000-acre Johnson Diversity Unit, approximately 21 miles northwest of Las Vegas, New Mexico. The project area includes the eastern slopes and base of the Sangre de Cristo Mountains. According to the EA, stands within the Road 18 area are predominantly overstocked, consisting of young to mid-aged ponderosa pine stands. Several small stands of Douglas fir occur at higher elevations. Many ponderosa pine and Douglas fir stands are converting to white fir. Age class distribution is poor, with an obvious lack of seedling/sapling, mature and old-growth structural stages as well as snags. In addition, a high road density in the area is contributing to illegal poaching of wood and wildlife.

The project proposes harvesting and burning activities designed primarily to enhance wildlife habitat in the southeastern part of the Johnson Diversity Unit. Of the 1,907-acre project area, the preferred alternative, Alternative 3, proposes to treat 1,026 acres in 31 treatment units. The project will modify the existing vegetation structure through the use of timber harvesting, thinning, prescribed burning, riparian improvement, and road closures. Methods of treatment will include individual selection, group selection/salvage, broadcast burning of brush, and underburning to reintroduce natural fire patterns, reduce litter/slash accumulation and provide increased forage for wildlife.

Two years of surveys were completed in 1992 and 1993 by District Wildlife Crews. One pair of owls was located in 1992 outside of the planning area but was not detected during 1993 surveys. The MT boundary for the pair overlaps portions of the project area. Of the 1,908 acres, 183 acres (9.6%) are considered suitable, 255 acres (13.4%) are considered capable and 1,470 acres (11.0%) are considered unsuitable according to the BA. No suitable habitat within the territory will be treated.

This project will alter 105 acres of suitable, 146 acres of capable, and 775 acres of potential foraging habitat.

Although a pair was found during 1992 surveys, no owls were detected during 1993 surveys. Harvesting within this area may not directly effect the owl but may have some indirect effects. However, harvesting could reduce the amount of existing and future large tree habitat which is already limited within the area. These large trees are important to a number of wildlife species and provide future snags and down logs.

BACKGROUND AND STATUS

Background and status information on the Mexican spotted owl has been described in the Final Rule listing the Mexican spotted owl as a threatened species (FR 58(49):14248-14271), and previous biological opinions delivered to Region 3 of the U.S. Forest Service on August 23, 1993, and October 8, 1993. The information provided in those documents is included herein by reference.

ENVIRONMENTAL BASELINE- MEXICAN SPOTTED OWL

The number of known locations of owls in forests in Region 3, together with mean suitable, capable and total MT acreage is presented by forest in Table 4 (based on unpublished Forest Service records). Current estimates of total acreage in suitable and capable habitat are listed by forest in Table 5.

Table 4. Distribution of established management territories (MTs) among forests, and mean acreage of suitable and capable habitat per MT.

Forest	MTs	Suitable	Capable	Total
Apache-Sitgreaves	89	1007	303	1884
Carson	3	1172	218	2010
Cibola	29	1250	71	1722
Coconino	123	943	645	2129
Coronado	96	861	408	1882
Gila	146	893	731	2066
Kaibab	4	1490	275	2559
Lincoln	113	1331	595	2075
Prescott	9	1378	393	1821
Santa Fe	31	1633	451	2344
Tonto	48	897	56	2187
Total	691			
Overall mean acres		1043	497	2034

The Forest Service began owl inventories in New Mexico and Arizona in 1988. Inventories in Colorado and Utah began in 1990. As of 1990, just over 2,000,000 acres had been inventoried (Fletcher 1990; Forest Service, Pike and San Isabel National Forest, in litt., 1990; Forest Service, Intermountain Region, in litt., 1990). Approximately 70% of the surveys were on lands available for timber harvest. At the time of this writing, 1,504,000 (Table 5) acres of suitable owl habitat have been surveyed in Region 3 (Henson 1993, in litt).

Table 5. Acreage of suitable and capable habitat on Region 3 National Forests (Data from Henson 1993, in litt.)

Forest	Suitable[1]	Surveyed	Capable[1]	Converted[2]	%[3]	Estimated take
A-S[4]	258,000	194,000	100,000	730	28	5
Carson	250,000	148,000	42,000	803	15	
Cibola	172,000	63,000	83,000	178	33	
Coconino	356,000	167,000	170,000	2036	33	8
Coronado	107,000	78,000	22,000	24	17	1
Gila	619,000	225,000	342,000	334	36	5
Kaibab	63,000	60,000	19,000	38	23	
Lincoln	371,000	267,000	24,000	577	6	
Prescott	133,000	10,000	53,000	49	29	0
Santa Fe	476,000	110,000	157,000	142	25	
Tonto	317,000	182,000	25,000	177	7	6
	3,122,000	1,504,000	1,037,000	5088	25[5]	25

[1] Prior to April 14, 1993, request for formal consultation.

[2] Proposed treatments in April 14, 1993, and May 19, 1993, request for formal consultation. These figures reflect the assumption that all treated suitable acres will be converted to capable.

[3] Percent of formerly suitable habitat that is now capable with the addition of the action in the April 14, 1993, and May 19, 1993, requests for formal consultation.

[4] Apache-Sitgreaves.

[5] Percent of total suitable habitat converted to capable.

Forest Service inventories through 1990 resulted in the establishment of 517 owl MTs in Arizona and New Mexico with each MT representing the occurrence of either a single owl or pair of owls. Approximately half the MTs were established from confirmed nest or roost localities; the other half were established only from night calling responses. On lands unavailable for timber harvest, only 30% of the MTs were established from confirmed nest or roost localities. There were 318 MTs (61%) on lands available for timber harvest and 199 MTs (39%) on lands not available for timber harvest. Among the MTs on lands not available for timber harvest, 102 were on lands unsuitable for timber harvest, 39 were on lands withdrawn from timber harvest, and 58 were on reserved lands such as wilderness areas (Fletcher 1990). The Forest Service reported 691 MTs for Arizona and New Mexico national forests as of 1993, but provided no new information about the area inventoried or distribution of owl MTs by types of land use.

EFFECTS OF THE PROPOSED ACTION ON LISTED SPECIES

EFFECTS OF FOREST ACTIVITIES - MEXICAN SPOTTED OWL

Timber harvest.

The effects of timber harvest on the Mexican spotted owl have been described in the Final Rule listing the Mexican spotted owl as a threatened species (FR 58(49):14248-14271), and previous biological opinions delivered

to Region 3 of the U.S. Forest Service on August 23, 1993, and October 8, 1993. That information is included herein by reference.

Effects of livestock grazing.

The effects of livestock grazing on owls and their habitat remain largely unknown. One effect could be the alteration of the vegetative structure of owl habitat due to browsing and trampling. Another effect could be a change in cover and food for small mammal prey populations, which could result in reduced prey numbers. Ganey (1992) found that a few species of small mammals comprised the majority of items represented in owl pellets in Arizona. The most common, Neotoma spp., Peromyscus spp., and Microtus spp., were common in pellets in the areas, seasons, and years he studied. However, he also observed differences in relative abundance of these prey species in different areas in Arizona. In northern Arizona, owls ate more Microtus and less Neotoma in mesic high elevation forests. In more xeric areas dominated by rocky canyons, Neotoma was better represented in pellets. Ganey concluded that management activities that reduce small mammal populations in areas inhabited by owls should be avoided, and that the effects of livestock grazing on herbaceous vegetation and Microtus abundance should be evaluated.

Effects of land exchanges.

Land exchanges between the Forest Service and other parties can result in the loss of suitable owl habitat. Suitable owl habitat and/or portions of management territories that are exchanged from the Forest Service land base could be subjected to a variety of land uses that result in the loss of suitability. The behavior of resident owls could be affected by the land exchanges, depending on the location and the ultimate use that is made of the land in the parcels. Exchanges and subsequently modified land uses can, depending upon location, serve to fragment habitats used by owls.

Effects of campground construction.

Construction of campgrounds or other recreational facilities could affect owls in a number of ways. Depending on the location, duration, intensity and other factors, the construction activity itself could result in changes in owl behavior. Loss of suitable owl habitat could be associated with the construction of recreation facilities. Increased human activity as a result of increased recreational opportunities in an area could also affect the the behavior of owls.

Effects of prescribed burning.

The adverse consequences of prescribed burning to owls and their habitat could be two-fold. The fire and smoke associated with burning could affect many aspects of owl behavior. The species nests and roosts within or below the forest canopy. Fire and smoke could affect foraging, roosting and reproductive behavior. Prescribed fire could also affect the prey and cover available to owls. This could further affect the ability of owls to adequately forage and successfully reproduce. Ganey (1992) suggested that

management activities that reduce small mammal populations in areas occupied by owls should be avoided. Beneficial effects of prescribed burning are reduction of wildfire hazard, reduction of intensity of pest and disease outbreaks, and positive population responses, both spatially and temporally, of some prey species to understory burns. The size, timing, intensity, duration, and location on the landscape of prescribed burns are all factors that may influence the overall effects of prescribed fires on owls.

Long-term Conservation Planning

The long-term conservation planning information on the Mexican spotted owl has been described in the Final Rule listing the Mexican spotted owl as a threatened species (FR 58(49):14248-14271), and previous biological opinions delivered to Region 3 of the U.S. Forest Service on August 23, 1993, and October 8, 1993, and is included in this biological opinion by reference.

INTERRELATED AND INTERDEPENDENT EFFECTS

Interrelated actions are actions that are part of a larger action, and are dependent on the larger action for their justification. Examples of activities in Region 3 that are interrelated to the projects considered in this consultation package are road maintenance and construction, development of skid trails and loading areas, stream crossings, road closures and pre-commercial thinning.

Interdependent actions are actions that have no independent utility apart from the action under consideration. Examples of interdependent actions include slash treatments and certain fuel management practices such as lop and scatter, machine piling, and controlled burning. In some cases, fuel management projects are implemented independent of other projects.

INDIRECT EFFECTS

Indirect effects are those that are caused by, or result from, the proposed action, and are later in time, but reasonably certain to occur. The most significant indirect effect that is expected to result from these projects will be increased access. Recreation activities that can be reasonably expected to increase will be sight-seeing, off-road-vehicle travel, and hunting. These are all forms of diffused recreation. Wood gathering and cutting may also occur in newly accessible areas. Uncontrolled gathering of snags and downed wood for fuel may have negative impacts on owl prey species. Increased predation may also result because of habitat modifications. The increased predation may be either a direct or indirect effect of the proposed action.

CUMULATIVE EFFECTS

Cumulative effects are those effects of future non-Federal (State, local government, or private) activities on endangered or threatened species or critical habitat that are reasonably certain to occur in the foreseeable

future. Future Federal actions are subject to the consultation requirements established in section 7, and, therefore, are not considered cumulative in the proposed action. Because of the predominant occurrence of the owls on Federal lands, and because of the role of the respective Federal agencies in administering the habitat of the owl, actions to be implemented in the future by non-Federal entities on non-Federal lands are considered of minor impact.

BIOLOGICAL OPINION

Based on the best scientific and commercial data available, it is the biological opinion of the Service that the action consisting of 22 projects addressed in this consultation package is not likely to jeopardize the continued existence of the Mexican spotted owl.

INCIDENTAL TAKE

Section 9 of the Act, as amended, prohibits taking (harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting, or attempting to engage in any such conduct) of listed species of fish and wildlife without a special exemption. Harass is further defined as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent to significantly disrupt normal behavior patterns. Normal behavior patterns include, but are not limited to, breeding, feeding, and sheltering. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the incidental take statement. The measures described below are nondiscretionary, and must be undertaken by the agency or made a binding condition of any grant or permit issued to the applicant, as appropriate.

For the purposes of consideration of incidental take of owls by the proposed project now under consultation, incidental take can be broadly defined as either the direct mortality of individual birds, or the alteration of habitat that affects the behavior of the birds in a manner that essential activities such as breeding or foraging are impeded to such a degree that the birds are considered lost as viable members of the population and are thus "taken." They may fail to breed, fail to successfully rear young due to inadequate food supplies available in altered habitat, or desert the area because of disturbance when habitat no longer meets the owls' needs.

Take is considered likely for the owl as a result of actions in suitable habitat in established MTs if suitable habitat exists at, or is reduced to, levels less than the mean acreage of suitable habitat within MTs for each specific National Forest included in this Biological Opinion, or 1,000 acres, whichever is greater, or if more than 10% of suitable habitat within a MT is harvested. Take is considered likely if suitable habitat within a

MT exists below the mean for the specific National Forest, or 1,000 acres, whichever is greater, and a sizeable area within the territory is to be subjected to treatments that will degrade owl habitat characteristics in that area. Take is also considered likely if habitat modifications outside MTs result in conditions less than those characteristic of the "Dispersal Habitat Rule" described below. Take is considered likely if proposed actions are located in such proximity to owl nest sites and/or core areas that disturbance of the birds is probable. There may be specific conditions in sales that reduce the likelihood of take when the above guidelines are exceeded, or cause take to occur in instances where they are not exceeded. Also, as our understanding of the owl's needs improves, the criteria used to establish take may change.

For the minimization of incidental take through habitat modification, the basic management unit established by the Forest Service for the owl, the MT, has been used. Based on a standardized survey protocol, the Forest Service has delineated MTs which serve to identify known areas of occupancy by the owls. Using those territories, and the available information concerning habitat classifications identified by the Forest Service, the Service has identified conditions of probable or likely take for those occupied sites.

A single MT, according to Forest Service protocol, encompasses approximately 2,000 acres. Within a MT, the Forest Service has delineated categories of habitat. Suitable habitat is considered to include all vegetative types that meet all life requisites of the owls: breeding, roosting, and foraging. Hence, this is considered the best habitat. The mean amount of suitable habitat within an individual territory varies by National Forest; each forest has its own mean acreage for suitable habitat by territory.

The available, albeit limited, information concerning the owl and its habitat use indicates that home ranges include a mean of approximately 1,000 acres of suitable habitat. The Forest Service has established MTs for the owl with the intent of retaining a minimum of 1,000 acres of suitable habitat in each territory throughout the range of the owl on Arizona and New Mexico National Forests (Interim Directive Number 2). Some forests, as shown in Table 3, have larger means, some smaller. This mean or average figure, however, fits only half the population of owls. Half the territories have larger amounts of suitable habitat, so it is likely that maintaining only 1,000 acres of suitable habitat will not be adequate for half the birds. Territories of this size and patches of suitable habitat of this size, by the very nature of averaging, do not accommodate the needs of owls that may require the larger sizes of territories or suitable habitat patches. However, based on the information currently available, the Service has utilized these means or averages in determining likelihood of take in established MTs where timber harvest is proposed by the Forest Service.

To date there has been no detailed study that identifies the specific habitat acreage needed by owls. The Service believes that 2,000-acre MTs are too small to provide for the year-round needs of owls; however, these

territories are established and habitat has been quantified within these units. For purposes of determining take, we consider a MT to be the best 2,000-acre polygon surrounding locations where owl presence was confirmed. We assume that owls are present in suitable habitat at full carrying capacity. We assume that the owls locate territories where conditions are adequate to support reproduction, but that they do not have the luxury of surplus suitable habitat. We assume that the statistical distribution of suitable habitat among MTs is normal. We do not know whether the ability of owls to survive on territories with different amounts of suitable habitat is because of variance in habitat quality or variance among owls. Given these assumptions, a territory with mean habitat available, mean for the forest, should be sufficient to support 50% of the owl population on that forest.

If habitat considered necessary for the owls (suitable habitat) is reduced below the Forest mean in any given territory, it is likely that the remaining amount of habitat will be insufficient to maintain the owls on that territory--they may leave the territory, starve, or fail to successfully breed or rear young. Thus, the expectation is that when habitat is reduced below the mean for the forest, there is a greater than 50% probability that take will occur. If a territory has less than the mean suitable habitat prior to treatment there will not be take unless additional harvest occurs. However if additional habitat is taken, further reducing suitable acreage within the territory, we again expect take. If the existing suitable habitat is less than the Forest mean (or 1,000 acres, whichever is greater) and a significant amount of area in a MT is degraded from current conditions, take also is expected to occur. This is one of our take thresholds, above that in Forest Service Interim Directive (ID) 2.

A second threshold is crossed if a project reduces habitat below the 1,000 acres required by ID 2.

A third instance of take occurs if more than 10% of suitable habitat within a MT is converted from suitable to capable. This condition reflects our uncertainty about the needs of individual owls. If owl home range sizes vary because of differences in habitat quality, and owls do not have excess suitable habitat within territories, eliminating any acreage of suitable habitat might result in take. We believe that the 10% criterion is reasonable.

The fourth threshold for take occurs when treatments occur during the breeding season within 1/4 mile of a nest tree, or, if the nest site is unknown, within 1/4 mile of a core, or within 1/4 mile of unsurveyed suitable habitat.

Over and above all the reasonable and prudent measures and attendant terms and conditions listed below, it is assumed by the Service that activities on National Forest lands will continue to be planned and conducted in accordance with the Forest Service's Interim Directive No. 2. Although the Service does not believe that reliance on the Interim Directive alone will conserve the owl, we believe its implementation will serve, in conjunction with the reasonable and prudent measures, to minimize incidental take of

the owl by the actions currently under consideration for this Biological Opinion. The conditions required by Interim Directive No. 2 are detailed in biological opinions on the effects of Forest Service projects on the owl delivered to Region 3 of the Forest Service on August 23, 1993, and October 8, 1993, and are included here by reference.

Occurrence of Take

The Service anticipates that owls could be taken as a result of this proposed action. Three projects (Ole Powerline, Cracker Box Timber Sale, and Twilight Campground Construction) of the proposed action are expected to result in take of owls. The incidental take is expected to be in the form of harassment and harm due to disruption of normal reproductive behavior and habitat modification or degradation.

Reasonable and Prudent Measures -- Terms and Conditions

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the incidental take of owls anticipated for the three projects listed above. In order to be exempt from the take prohibitions of section 9 of the Act, the Forest Service must comply with the mandatory terms and conditions listed under the measures to which they apply.

As set forth in 50 CFR Part 402.14 (i) (3), in order to monitor the impacts of incidental take, the Forest Service or any applicant must report the progress of the action and its impact on the owl to the Service as specified in the incidental take statement.

The Forests shall provide on-site review and direction to ensure that no direct mortalities of owls will occur. Formal monitoring of selected MTs in or adjacent to the action areas will be conducted for the next 5 years to determine if the level of incidental take is exceeded. Many of the MTs affected by this project are currently being monitored. Additional MTs will be identified by the forests, in concert with research and Service biologists, to develop a statistically valid study plan to discern the effects of habitat alteration and disturbance on adjacent management territories. The monitoring plan should be prepared in time to be implemented during the 1994 breeding season. Additional territories will need to be added in the future when management impacts additional occupied habitat.

Reasonable and prudent measures and terms and conditions:

1. Conduct all proposed actions in a manner that will minimize direct and indirect mortalities, and disturbance of owls.

1.1 The projects will not exceed treatment limits and will meet the minimum habitat requirements of the Forest Service Interim Directive Number 2 for owls.

1.2 No silvicultural treatments or construction activity will be conducted within 0.25 miles of a known nest site, within 0.25 miles of a core area when the nest site is undetermined, or within 0.25 miles of unsurveyed suitable habitat during the breeding season, February 1 to August 31.

1.3 Devlopment of the Twilight Campground may be done only to the extent that the current average daily use by recreationists during the breeding season is not exceeded. Alternatively, the campground may be developed as described, but it will be closed to use during the owl breeding season.

2. Conduct all proposed actions in a manner that will minimize modification and loss of owl habitat.

2.1 Timber harvest within MTs will only occur after the following conditions are met:

2.1.a If an entered MT contains less than the Forest mean of suitable acres within MTs as defined in Table 3, or less than 1,000 acres, then sufficient additional acreage of the best remaining habitat, whether in treatment units or not, will be reallocated and added to the suitable habitat for that territory to reach the Forest mean, or 1,000 acres whichever is greater, and all harvest is prohibited on those acres.

2.1.b For those sales for which the above term and condition applies, the Forest Service will provide maps showing which acreage was re-allocated together with a description of the habitat (reallocated acres plus existing suitable acres) to the appropriate Service Ecological Services State Office fcr concurrence prior to timber harvest activities in the remainder of the MT.

2.1.c No harvest will occur in suitable habitat in MTs that would bring the amount of suitable habitat below the mean number of acres of suitable habitat established for the specific National Forest identified in Table 3, or 1000 acres, whichever is greater.

2.1.d No more than 10% of suitable habitat will be removed from any one MT.

2.2 In order to avoid the likelihood of take of dispersing and non-territorial owls through increased vulnerability to predation and lack of foraging habitat, dispersal habitat should be maintained. Apply the 50-11-40 rule (Thomas et al. 1990), as modified below, on habitats lying exterior to established MTs that are also recognized as providing the edaphic and/or biological conditions to support the 50-11-40 characteristics. Because the 50-11-40 rule is being modified

for New Mexico and Arizona forests, we will refer to it below as the "Dispersal Habitat Rule" (DHR). The conditions of DHR will be applied within the Analysis Area encompassing the proposed timber sale. The Service is not advocating that all stands be reduced to the minimum standard of the DHR rule. However, all habitat within an analysis area capable of supporting the DHR characteristics will be subject to these minimum leave conditions. Suitable habitat within the matrix will provide adequate cover and should be retained as suitable habitat. Capable habitat may or may not provide sufficient cover depending on leave conditions.

The Interagency Scientific Committee ([ISC], Thomas et al. 1990) recommended that at least 50% of the forest matrix outside the habitat conservation areas (HCAs) be maintained in stands with a mean dbh of 11 inches or greater, and with at least 40% canopy closure. The standards and guidelines section of the ISC report (Appendix Q: 327) call for application of this rule (the 50-11-40 rule) to forest land in every quarter township.

The ISC considered how best to maintain connectivity among the HCAs developed for the northern spotted owl. They cite Weins (1989:217) who notes that:

> "A focus exclusively on fragmentation of habitats misses the point that it is often the structure of an entire landscape mosaic rather than the size or shape of individual patches that is important to birds. The likelihood that dispersal can occur between fragments and forestall the extinction of sensitive species on a regional scale is influenced by the configuration of fragments and the landscape mosaic in which they are embedded."

The ISC developed guidelines that would provide a landscape matrix that would be suitable for dispersal. They state (p. 309):

> "These zones are not designed for preservation. Many existing management practices, including those associated with certain timber harvest methods, provide habitat attributes conducive to spotted owl dispersal. Examples include visual corridors, riparian corridors, and streamside management zones, which contain possible stopover sites as do other areas deferred from harvest for a variety of reasons."

In the northwest, 50% of the forest acreage under management would be greater than 40 years old, given an 80-year rotation cycle, and much of that would also provide dispersal habitat.

Because Mexican spotted owls evolved in southwestern forests which are naturally fragmented, and which grow more slowly than the conifer forests of the Pacific northwest, we recommend that the 50-11-40 rule be modified. Because many of the stands that provide dispersal habitat in the southwest are uneven age, unlike the even age second growth stands in the northwest, the requirement that average tree diameter be 11 inches may not be appropriate. This is because uneven aged stands tend to be comprised of many more small than large trees. This has the effect of reducing the mean tree diameter in the stand. Instead, the Forest Service will follow one of the guidelines below to meet the 11 inch standard in ponderosa pine. First, beginning with the largest trees in the stand, save successively smaller diameter class trees until 40% canopy closure is retained. If the average stem diameter is greater than or equal to 9 inches, then the stand meets the criterion for dispersal. Second, apply the Taylor Woods formula to trees greater than 9 inches dbh to retain a minimum of 30% canopy closure, and retain sufficient additional trees greater than 5 inches dbh to retain an additional 10% canopy closure. This will also yield a total of 40% canopy closure and provide dispersal habitat. We do not require that this standard be applied to stands of pinyon-juniper, scrub oak or other stands that are edaphically unable to meet these conditions. As stated above, we do not advocate applying this formula to suitable or capable habitat.

The Service believes that the DHR will conserve dispersal habitat in forested zones outside management territories in New Mexico and Arizona, thereby minimizing the likelihood of take. The rule will be applied to guarantee that no treatments will degrade the forest matrix to a condition below the DHR standard in the analysis area, and the standard will remain effective following any harvest treatment.

2.3 Slash or fuels treatments, including controlled burns, will maintain sufficient dead and down material to support owl prey species. As a minimum, the guidelines contained in the March 22, 1993, Forest Service direction (reference 2670/2430) to the Forests will be followed.

3. We realize that the Forest Service may develop additional project modifications which are intended to further minimize take of the owl. The Forest Service will coordinate the possible implementation of these modifications with the appropriate Service State Office.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impacts of the incidental take that might otherwise result from the proposed action. With implementation of these measures the Service believes that no more than 7 owls will be incidentally taken through harm or harassment by the proposed project of 22 actions addressed by this consultation. There is no expected incidental

take that will result in direct mortality. Anticipated incidental take in the form of dead birds is set at 0. Because formal consultations on additional Forest Service actions are underway and will have biological opinions issued prior to the completion of the projects of this proposed action, the total of 7 Mexican spotted owls authorized by this incidental take statement will be considered deleted from the population for future analyses of the environmental baseline and status of the species.

Reporting Requirements

If, during the course of the action, this level of incidental take is exceeded on any sale or in aggregate, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Upon locating a dead, injured, or sick individual of an endangered or threatened species, initial notification must be made to the nearest Fish and Wildlife Service Law Enforcement Office. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed. In Arizona, contact (602/379-6443) or the Arizona State Office (602/379-4720). In New Mexico, contact (505/883-7814) or the New Mexico State Office (505/883-7877).

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The term "conservation recommendations" has been defined as Service suggestions regarding **discretionary agency activities** to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility for these species. For each individual project in the Region-wide action where a particular conservation recommendation can physically be applied, it is recommended that it should be applied. Many of the recommendations will not apply to all projects, but we recommend implementing those where conditions apply. The terms and conditions provided with the reasonable and prudent measures apply specifically to sales involving take. The conservation recommendations apply to all activities.

Conservation recommendations:

A. The Service recommends that a true programmatic section 7 consultation be conducted on all future proposed activities in Region 3 of the Forest Service when possible. We believe that such a programmatic overview will provide the scope of action assessment necessary to address all direct, indirect and cumulative impacts to the owl. In addition, it will identify opportunities to conserve the species on forest lands in the most effective manner. If this recommendation is too ambitious, consultation on individual forest timber programs or forest plans would also be beneficial. Consultations conducted in this manner would ensure the best long-term protection for the owl and aid the Forest Service in its planning efforts.

B. Suitable Habitat. Timber harvest treatments in suitable habitat should be deleted from the individual projects of the action.

C. Capable Habitat. Capable habitat should only receive treatments if those treatments can be shown to lead to faster return to suitability than if no treatment occurred. The California spotted owl Technical Application Team (TAT; Verner et al. 1992) developed a strategy for treatment of habitat for California spotted owls which they believed would have minimal adverse effects on owl habitat. They "focused on setting strong rules to retain stand components that are most at risk and hardest to replace" (pp. 25). The following treatment program is modified from their recommendations in an effort to retain aspects of the habitat that are most difficult to recover after they have been lost. The elements that are at greatest risk are the largest, oldest trees, and the complex stand structure. Snags and large dead wood are also important and may be at risk as well. The TAT developed a tree size profile for the relevant forests and identified the components of the forests that were most important to owls. They determined that in nesting habitat the 40% of basal area in the largest trees should be retained, and that no trees greater than 30 inches dbh should be harvested. If there were inadequate trees in the large size class to provide 40% canopy closure, they called for adding trees in smaller size classes until 40% canopy closure was obtained. Their rationale for allowing harvest in the smaller size classes was that a 30-inch tree could easily grow in 100 years or less, and so was replaceable. In addition, the 40% canopy closure in large trees was expected to provide suitable foraging habitat. In New Mexico and Arizona, tree growth rates are slower than in the Sierra Nevada and other ranges in southern and west California. Furthermore, we do not have tree size profiles for mountain ranges in New Mexico and Arizona. The following recommendations are an attempt to blend the TAT recommendations with individual tree selection techniques that are used on some Native American timberlands in the two states.

To repeat, the goals are to retain the largest trees in the stand, to provide replacements for those trees when they die or fall, and to

retain existing canopy structure. This treatment is recommended to speed the return of capable habitat to a condition suitable for owls.

Retain, but do not include in basal area (BA) calculations, all hardwoods greater than 4 inches (10 cm) dbh up to a basal area of 30 square feet. Retain the largest trees in the stand to 20 square feet of BA. In smaller size classes, try to retain 55 square feet of BA area as follows: 18 - 23.9 inch dbh = 20 - 25 BA; 12 - 17.9 inch dbh = 20 - 25 BA; 5 - 11.9 inch dbh 10 - 15 BA. Retain sufficient trees less than 5 inches dbh to provide recruits into the 5 - 11.9 inch size class at the next entry. If trees are not available in a given size class this entry, try to mark the stand so that this size distribution will be available at the next entry.

D. Unsuitable Habitat. Treatments should not degrade unsuitable habitat below the conditions outlined in the DHR rule identified in the terms and conditions number 2.2.

E. Slash or fuels treatments, including controlled burns, should maintain sufficient dead and down material to support owl prey species. To help ensure the above, the guidelines in the March 22, 1993, Forest Service direction (Reference 2670/2430) to the forests should be followed to maintain at least the minimum leave conditions contained therein.

F. Do not **schedule** controlled burns in MTs during the breeding season. This recommendation should not apply to prescribed or other natural fires which behave according to forest fire guidelines, by remaining "cool" understory burns. We concur with the forests that fuel build-up in suitable habitat is hazardous, and we encourage continued efforts to reduce those hazards.

G. Retain sufficient small trees (1-5") in treatment units to ensure recruits for uneven-aged structure in the future.

H. Conduct no silvicultural treatments or construction activity during the breeding season within 0.25 miles of a known nest site, within 0.25 miles of a core area when the nest site is undetermined, or within 0.25 miles of unsurveyed suitable habitat.

I. Treatments should not result in loss of the number of pre-treatment canopy layers in a given stand.

J. Unsuitable habitat adjacent to suitable or capable habitat, whether occupied or not, should be retained as foraging habitat by retaining sufficient basal area, canopy cover and structure, and dead and down woody material.

K. We recommend that livestock grazing be limited in the owl MTs in the Lyons Fork Allotment Management Plan (AMP). The BE for the AMP implied that development of Wild Cow Springs would result in piping water to a trough 0.25 miles downstream from the springs. If this is

not the case, we recommend that any development at this spring should only result in a water source as far away from the owl MT as possible. In addition, we recommend that livestock grazing should not be introduced to MTs where it has not occured in the past 5 years. The Service recommends that the Forest Service develop a research study of effects of grazing on rodent populations in owl habitat. Implementation of the AMP affords an excellent opportunity to initiate such a study to help determine the effects of livestock grazing on the prey base of owls. Monitoring of the owl MT should continue as well.

L. The Service recommends that no additional development of the Twilight Campground occur if such development would increase the level of recreational use. We believe that campgrounds should not be developed in MTs.

M. If the Forest Service plans to develop new guidelines to replace ID No. 2, we recommend that such guidelines address management beyond established MTs.

N. Mexican spotted owls have not been detected in some areas that contain apparently suitable owl habitat. The Service recommends that the survey protocol be examined and improved to increase the probability of detecting owls in such areas.

In order for the Service to be kept informed of actions that either minimize or avoid adverse effects or that benefit listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

CONCLUSION

This concludes formal consultation on the projects submitted to the Service by Region 3 of the Forest Service on July 9, July 23, July 29, August 19, and September 3, 1993. As required by 50 CFR 402.16, reinitiation of formal consultation is required if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may impact listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

Thank you for your continuing efforts to conserve and recover threatened and endangered species on the National Forests.

Sincerely,

for Sam F. Spiller
State Supervisor
Arizona Ecological Services
State Office

Jennifer Fowler-Propst
State Supervisor
New Mexico Ecological Services
State Office

Enclosure

cc: (w/enc)
Forest Supervisor, Carson National Forest, Taos, New Mexico
Forest Supervisor, Cibola National Forest, Albuquerque, New Mexico
Forest Supervisor, Coconino National Forest, Flagstaff, Arizona
Forest Supervisor, Coronado National Forest, Tucson, Arizona
Forest Supervisor, Gila National Forest, Silver City, New Mexico
Forest Supervisor, Lincoln National Forest, Alamogordo, New Mexico
Forest Supervisor, Prescott National Forest, Prescott, Arizona
Forest Supervisor, Tonto National Forest, Phoenix, Arizona
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